

**Notice of Allowability**

Application No.

10/712,791

Applicant(s)

SMITHERS ET AL.

Examiner

Art Unit

Jason R. Kurr

2615

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--**

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to application filed November 12, 2003.
2. ☒ The allowed claim(s) is/are 1-36.
3. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
  - a) ☐ All    b) ☐ Some\*    c) ☐ None    of the:
  1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

\* Certified copies not received: \_\_\_\_\_.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

**THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.**

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
  5. ☐ CORRECTED DRAWINGS ( as "replacement sheets") must be submitted.
    - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review ( PTO-948) attached
      - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date \_\_\_\_\_.
    - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date \_\_\_\_\_.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

**Attachment(s)**

1. ☒ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. ☒ Information Disclosure Statements (PTO/SB/08),  
Paper No./Mail Date 8/30/04 3/17/05
4. ☐ Examiner's Comment Regarding Requirement for Deposit  
of Biological Material
5. ☐ Notice of Informal Patent Application
6. ☒ Interview Summary (PTO-413),  
Paper No./Mail Date 20070815.
7. ☒ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other \_\_\_\_\_.

### **EXAMINER'S AMENDMENT**

An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it **MUST** be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with the Applicant's attorney Thomas Gallagher on August 9, 2007.

The application has been amended as follows:

Claims 1, 2, 5, 8, 12, 13, 17, 22, 28 and 33 contain the phrases "the next preceding frame" and "the next following frame". The word "next" has been deleted from each of these phrases in each of these claims.

Claim 2 has been amended to include: "transmitting, storing, or transmitting and storing the modified frames for subsequent processing in which the sequential order of the modified frames is maintained or modified, audio segments preceding a discontinuity are faded down and audio segments following a discontinuity are faded up, then the audio segments are additively combined."

Claim 32 contains the word "wherein" twice. One of these has been deleted.

Claims 1, 2, 5, 8, 12, 13, 17, 22, 28, 32 and 33 have been changed to:

--1. A method for processing one or more ordered sequences of PCM audio frames, comprising appending to the beginning of frames, a segment of PCM audio that is substantially a replica of PCM audio in the end of the preceding frame in an ordered

Art Unit: 2615

sequence, or, to the end of frames, a segment of PCM audio that is substantially a replica of PCM audio in the beginning of the following frame in an ordered sequence, whereby modified frames are produced, maintaining for the modified frames a sequential order that is the same as the order of one of said one or more ordered sequences of the PCM audio frames or assigning a further sequential order to the modified frames, which sequential order is different from the order of one of said one or more ordered sequences of PCM audio frames, whereby the further sequential order has at least one discontinuity in its order with respect to the order of one of said one or more ordered sequences of PCM audio frames, fading up the PCM audio appended to the beginning of the modified frame following a discontinuity and fading down the PCM audio in the end of the modified frame preceding a discontinuity when segments are appended to the beginning of frames or fading down the PCM audio appended to the end of the modified frame preceding a discontinuity and fading up the PCM audio in the beginning of the modified frame following a discontinuity when segments are appended to the end of frames, overlapping and additively combining the faded-up and faded-down PCM audio preceding and following a discontinuity in the sequence of faded-up and faded-down modified frames, and removing the segment of PCM audio appended to a modified frame in sequential pairs of modified frames and joining the resulting PCM audio frames when the sequential pair of modified frames does not contain a discontinuity following or preceding the appendage, whereby a further ordered sequence of PCM audio frames is provided having the same order as one of said one or more ordered sequences of PCM audio frames or having one or more discontinuities

Art Unit: 2615

between sequences of PCM audio frames, each of said sequences having the same order as one of said one or more ordered sequences of PCM audio frames or a portion thereof, discontinuities having an associated PCM audio crossfaded portion where said faded-up and faded-down PCM audio is overlapped and combined.--

--2. A method for processing one or more ordered sequences of PCM audio frames, comprising appending only to the beginning of frames, a segment of PCM audio that is substantially a replica of PCM audio in the end of the preceding frame in an ordered sequence, or, to the end of frames, a segment of PCM audio that is substantially a replica of PCM audio in the beginning of the following frame in an ordered sequence, whereby modified frames are produced, and transmitting, storing, or transmitting and storing the modified frames for subsequent processing in which the sequential order of the modified frames is maintained or modified, audio segments preceding a discontinuity are faded down and audio segments following a discontinuity are faded up, then the audio segments are additively combined.--

--5. A method for processing PCM audio data, comprising receiving modified PCM audio frames, wherein the modified frames were produced by processing one or more ordered sequences of PCM audio frames by appending to the beginning of frames, a segment of PCM audio that is substantially a replica of PCM audio in the end of the preceding frame in an ordered sequence, or, to the end of frames, a segment of PCM audio that is substantially a replica of PCM audio in the beginning of the following frame in an ordered sequence, maintaining for the modified frames a sequential order that is the same as the order of one of said one or more ordered sequences of the PCM

audio frames or assigning a further sequential order to the modified frames, which sequential order is different from the order of one of said one or more ordered sequences of PCM audio frames, whereby the further sequential order has at least one discontinuity in its order with respect to the order of one of said one or more ordered sequences of PCM audio frames, fading up the PCM audio appended to the beginning of the modified frame following a discontinuity and fading down the PCM audio in the end of the modified frame preceding a discontinuity when segments are appended to the beginning of frames or fading down the PCM audio appended to the end of the modified frame preceding a discontinuity and fading up the PCM audio in the beginning of the modified frame following a discontinuity when segments are appended to the end of frames, overlapping and additively combining the faded-up and faded-down PCM audio preceding and following a discontinuity in the sequence of faded-up and faded-down modified frames, and removing the segment of PCM audio appended to a modified frame in sequential pairs of modified frames and joining the resulting PCM audio frames when the sequential pair of modified frames does not contain a discontinuity following or preceding the appendage, whereby a further ordered sequence of PCM audio frames is provided having the same order as one of said one or more ordered sequences of PCM audio frames or having one or more discontinuities between sequences of PCM audio frames, each of said sequences having the same order as one of said one or more ordered sequences of PCM audio frames or a portion thereof, discontinuities having an associated PCM audio crossfaded portion where said faded-up and faded-down PCM audio is overlapped and combined.--

--8. A method for processing PCM audio data, comprising receiving modified PCM audio frames, wherein the modified frames were produced by processing one or more ordered sequences of PCM audio frames by appending to the beginning of frames, a segment of PCM audio that is substantially a replica of PCM audio in the end of the preceding frame in an ordered sequence, or, to the end of frames, a segment of PCM audio that is substantially a replica of PCM audio in the beginning of the following frame in an ordered sequence, and have a sequential order that is the same as the order of one of said one or more ordered sequences of the PCM audio frames or have a further sequential order, which sequential order is different from the order of one of said one or more ordered sequences of PCM audio frames, whereby the further sequential order has at least one discontinuity in its order with respect to the order of one of said one or more ordered sequences of PCM audio frames, fading up the PCM audio appended to the beginning of the modified frame following a discontinuity and fading down the PCM audio in the end of the modified frame preceding a discontinuity when segments are appended to the beginning of frames or fading down the PCM audio appended to the end of the modified frame preceding a discontinuity and fading up the PCM audio in the beginning of the modified frame following a discontinuity when segments are appended to the end of frames, overlapping and additively combining the faded-up and faded-down PCM audio preceding and following a discontinuity in the sequence of faded-up and faded-down modified frames, and removing the segment of PCM audio appended to a modified frame in sequential pairs of modified frames and joining the resulting PCM audio frames when the sequential pair of modified frames

Art Unit: 2615

does not contain a discontinuity following or preceding the appendage, whereby a further ordered sequence of PCM audio frames is provided having the same order as one of said one or more ordered sequences of PCM audio frames or having one or more discontinuities between sequences of PCM audio frames, each of said sequences having the same order as one of said one or more ordered sequences of PCM audio frames or a portion thereof, discontinuities having an associated PCM audio crossfaded portion where said faded-up and faded-down PCM audio is overlapped and combined.--

--12. A method for processing one or more ordered sequences of PCM audio frames, comprising appending to the beginning of frames, a segment of PCM audio that is substantially a replica of PCM audio in the end of the preceding frame in an ordered sequence, or, to the end of frames, a segment of PCM audio that is substantially a replica of PCM audio in the beginning of the following frame in an ordered sequence, whereby modified frames are produced, fading up the PCM audio appended to the beginning of modified frames and fading down the PCM audio in the end of modified frames when segments are appended to the beginning of frames or fading down the PCM audio appended to the end of modified frames and fading up the PCM audio in the beginning of modified frames when segments are appended to the end of frames, maintaining for the modified frames or for the faded-up and faded-down modified frames a sequential order that is the same as the order of one of said one or more ordered sequences of the PCM audio frames or assigning a further sequential order to the modified frames or to the faded-up and faded-down modified frames, which sequence is different from the order of one of said one or more ordered sequences of PCM audio

Art Unit: 2615

frames, whereby the further sequential order has at least one discontinuity in its order with respect to the order of one of said one or more ordered sequences of PCM audio frames, and overlapping and additively combining sequential pairs of faded-up and faded-down PCM audio in the sequence of faded-up and faded-down modified frames having a sequential order that is the same as the order of one of said one or more ordered sequences of the PCM audio frames or having said further sequential order, whereby a further ordered sequence of PCM audio frames is provided having the same order as one of said one or more ordered sequences of PCM audio frames or having one or more discontinuities between sequences of PCM audio frames, each of said sequences having the same order as one of said one or more ordered sequences of PCM audio frames or a portion thereof, consecutive pairs in the further order of PCM audio frames having an associated PCM audio crossfaded portion where said faded-up and faded-down PCM audio is overlapped and combined.--

--13. A method for processing one or more ordered sequences of PCM audio frames, comprising appending only to the beginning of frames, a segment of PCM audio that is substantially a replica of PCM audio in the end of the preceding frame in an ordered sequence, or, to the end of frames, a segment of PCM audio that is substantially a replica of PCM audio in the beginning of the following frame in an ordered sequence, whereby modified frames are produced, fading up the PCM audio appended to the beginning of modified frames and fading down the PCM audio in the end of modified frames when segments are appended to the beginning of frames or fading down the PCM audio appended to the end of modified frames and fading up the



Art Unit: 2615

PCM audio in the beginning of modified frames when segments are appended to the end of frames, and transmitting, storing, or transmitting and storing the faded-up and faded-down modified frames.--

--17. A method for processing PCM audio, comprising receiving faded-up and faded-down modified PCM audio frames, wherein the faded-up and faded-down modified frames were produced by processing one or more ordered sequences of PCM audio frames by appending to the beginning of frames, a segment of PCM audio that is substantially a replica of PCM audio in the end of the preceding frame in an ordered sequence, or, to the end of frames, a segment of PCM audio that is substantially a replica of PCM audio in the beginning of the following frame in an ordered sequence, and fading up the PCM audio appended to the beginning of modified frames and fading down the PCM audio in the end of modified frames when segments are appended to the beginning of frames or fading down the PCM audio appended to the end of modified frames and fading up the PCM audio in the beginning of modified frames when segments are appended to the end of frames, maintaining for the faded-up and faded-down modified frames a sequential order that is the same as the order of one of said one or more ordered sequences of the PCM audio frames or assigning a further sequential order to the faded-up and faded-down modified frames, which sequence is different from the order of one of said one or more ordered sequences of PCM audio frames, whereby the further sequential order has at least one discontinuity in its order with respect to the order of one of said one or more ordered sequences of PCM audio frames, and overlapping and additively combining sequential pairs of faded-up and

Art Unit: 2615

faded-down PCM audio in the sequence of faded-up and faded-down modified frames, whereby a further ordered sequence of PCM audio frames is provided in which consecutive pairs of PCM audio frames have a PCM audio crossfaded portion where said faded-up and faded-down PCM audio is overlapped and combined.--

--22. A method for processing PCM audio, comprising receiving faded-up and faded-down modified PCM audio frames, wherein the faded-up and faded-down modified frames were produced by processing one or more ordered sequences of PCM audio frames by appending to the beginning of frames, a segment of PCM audio that is substantially a replica of PCM audio in the end of the preceding frame in an ordered sequence, or, to the end of frames, a segment of PCM audio that is substantially a replica of PCM audio in the beginning of the following frame in an ordered sequence, and fading up the PCM audio appended to the beginning of modified frames and fading down the PCM audio in the end of modified frames when segments are appended to the beginning of frames or fading down the PCM audio appended to the end of modified frames and fading up the PCM audio in the beginning of modified frames when segments are appended to the end of frames, wherein the faded-up and faded-down modified PCM audio frames have a sequential order that is the same as the order of one of said one or more ordered sequences of the PCM audio frames or have a further sequential order, which sequential order is different from the order of one of said one or more ordered sequences of PCM audio frames, whereby the further sequential order has at least one discontinuity in its order with respect to the order of one of said one or more ordered sequences of PCM audio frames, and overlapping and additively

combining sequential pairs of faded-up and faded-down PCM audio in the sequence of faded-up and faded-down modified frames, whereby a further ordered sequence of PCM audio frames is provided in which consecutive pairs of PCM audio frames have a PCM audio crossfaded portion where said faded-up and faded-down PCM audio is overlapped and combined.--

--28. A method for processing PCM audio, comprising receiving modified PCM audio frames, wherein the modified frames were produced by processing one or more ordered sequences of PCM audio frames by appending to the beginning of frames, a segment of PCM audio that is substantially a replica of PCM audio in the end of the preceding frame in an ordered sequence, or, to the end of frames, a segment of PCM audio that is substantially a replica of PCM audio in the beginning of the following frame in an ordered sequence, fading up the PCM audio appended to the beginning of modified frames and fading down the PCM audio in the end of modified frames when segments are appended to the beginning of frames or fading down the PCM audio appended to the end of modified frames and fading up the PCM audio in the beginning of modified frames when segments are appended to the end of frames, maintaining for the modified frames or for the faded-up and faded-down modified frames a sequential order that is the same as the order of one of said one or more ordered sequences of the PCM audio frames or assigning a further sequential order to the modified frames or to the faded-up and faded-down modified frames, which sequence is different from the order of one of said one or more ordered sequences of PCM audio frames, whereby the further sequential order has at least one discontinuity in its order with respect to the

Art Unit: 2615

order of one of said one or more ordered sequences of PCM audio frames, and overlapping and additively combining sequential pairs of faded-up and faded-down PCM audio in the sequence of faded-up and faded-down modified frames, having a sequential order that is the same as the order of one of said one or more ordered sequences of the PCM audio frames or having said further sequential order, whereby a further ordered sequence of PCM audio frames is provided in which consecutive pairs of PCM audio frames have a PCM audio crossfaded portion where said faded-up and faded-down PCM audio is overlapped and combined.--

--32. A method according to claim 28 or 31 wherein fading up and fading down includes multiplying a portion of PCM audio by a fading function and subtracting the portion of PCM audio resulting from the multiplication from another portion of PCM and wherein the further sequence of PCM audio frames have the same order as at least a portion of the received ordered sequence of PCM audio frames, whereby the further sequence of PCM audio frames constitutes a substantially identical reconstruction of said at least a portion of the received ordered sequence of PCM audio frames.--

--33. A method for processing PCM audio, comprising receiving modified PCM audio frames, wherein the modified frames were produced by processing one or more ordered sequences of PCM audio frames by appending to the beginning of frames, a segment of PCM audio that is substantially a replica of PCM audio in the end of the preceding frame in an ordered sequence, or, to the end of frames, a segment of PCM audio that is substantially a replica of PCM audio in the beginning of the following frame in an ordered sequence, and have a sequential order that is the same as the order of

Art Unit: 2615

one of said one or more ordered sequences of the PCM audio frames or have a further sequential order, which sequential order is different from the order of one of said one or more ordered sequences of PCM audio frames, whereby the further sequential order has at least one discontinuity in its order with respect to the order of one of said one or more ordered sequences of PCM audio frames, fading up the PCM audio appended to the beginning of modified frames and fading down the PCM audio in the end of modified frames when segments are appended to the beginning of frames or fading down the PCM audio appended to the end of modified frames and fading up the PCM audio in the beginning of modified frames when segments are appended to the end of frames, and overlapping and additively combining sequential pairs of faded-up and faded-down PCM audio in the sequence of faded-up and faded-down modified frames, whereby a further ordered sequence of PCM audio frames is provided in which consecutive pairs of PCM audio frames have a PCM audio crossfaded portion where said faded-up and faded-down PCM audio is overlapped and combined.--

### **REASONS FOR ALLOWANCE**

The following is an examiner's statement of reasons for allowance: The general concept of replicating a segment of a frame of PCM data and appending it an end of an adjacent frame of data was known in the art at the time of the invention, as evidenced by Wang et al (US 2005/0068886 A1) figure 2C, page 5 paragraph [0053]. The general concept of using an overlap and add function to compensate for frame erasures was known in the art at the time of the invention as evidenced by Kapilow (US 6,952,668 B1)

Art Unit: 2615

column 4 lines 37-67, column 5 lines 1-19. However, the Examiner has not found prior art that teaches or suggests the modification of Wang or Kapilow in order to replicate and append data segments between adjacent frames prior to an overlap and add function as defined in the independent claims 1, 2, 5, 8, 12, 13, 17, 22, 28 and 33.

Other prior art has been cited herein regarding crossfading of adjacent frames in the presence of a frame discontinuity. However, the other prior art of record also fails to teach or provide suggestion to arrive the combination of the elements and steps presented in the independent claims, again when said elements or steps are collectively considered in regards to each claim. For at least the reasons listed above, the dependent claims are also allowed in view of their respective dependencies upon the independent claims.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

### ***Conclusion***

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Kapilow (US 6,952,668 B1) and (US 7,117,156 B1) disclose a method and apparatus for performing packet loss or frame erasure concealment.

Wang et al (US 2005/0068886 A1) discloses a multi symbol encapsulated OFDM transmission.


Friedman et al (US 2004/0196989 A1) discloses a method and apparatus for expanding audio data.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jason R. Kurr whose telephone number is (571) 272-0552. The examiner can normally be reached on M-F 10:00am to 6:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vivian Chin can be reached on (571) 273-7848. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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